

# **I Claim:**

1. In a batch liquid purifier combining an ozone generator producing ozone-containing gas, a reservoir for holding liquid during purification, and a pumping system operating during purification to pump the ozone-containing gas into contact with the liquid in the reservoir, an improvement comprising a vent pumping system arranged to exhaust air and ozone-containing gas from a vent space above the liquid in the reservoir.

2. The improvement of claim 1 wherein a pump for the vent pumping system is arranged downstream of the vent space and creates a subatmospheric pressure in the vent space.

3. The improvement of claim 1 wherein the vent pumping system flows air into the vent space.

4. The improvement of claim 1 wherein air flowing into the vent space enters the vent space through a porous element that is hydrophobic.

5. The improvement of claim 1 wherein gas flowing out from the vent space departs from the vent space through a porous element that is hydrophobic.

6. The improvement of claim 1 wherein the reservoir has an access opening large enough to permit cleaning the reservoir interior and including a closure lid arranged over the reservoir opening.

7. The improvement of claim 6 including a switch enabling operation of the purifier when the lid is closed.

8. The improvement of claim 6 including an indicator arranged for indicating completion of the purification process.

9. The improvement of claim 1 including a system for dispensing purified liquid from the reservoir.

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B 21. <sup>23</sup> The improvement of claim 1 <sup>11</sup> ~~wherein~~ <sup>arranged so that</sup> gas from the vent space is delivered by the vent pumping system to an ozone reducing element and then to atmosphere.

B a 22. <sup>34</sup> The improvement of claim ~~1~~ <sup>1</sup> ~~wherein~~ <sup>arranged so that</sup> liquid is prevented from entering an air inlet and an air and ozone gas outlet from the vent space.

23. <sup>35</sup> The improvement of claim 1 wherein a lid closes the vent space over the reservoir during operation of the vent pumping system.

10 24. <sup>36</sup> The improvement of claim ~~23~~ <sup>35</sup> including a lid lock device operable during a purification cycle.

B 25. <sup>37</sup> The improvement of claim ~~23~~ <sup>35</sup> ~~wherein~~ <sup>arranged so that</sup> opening the lid resets the purifier to assume liquid in the reservoir is impure.

15 26. <sup>38</sup> The improvement of claim ~~23~~ <sup>35</sup> including an indicator activated after completion of a venting cycle for indicating that it is safe to open the lid.

B 27. <sup>14</sup> The improvement of claim ~~9~~ <sup>8</sup> ~~wherein~~ <sup>arranged so that</sup> liquid access to the dispensing system is blocked at the reservoir to prevent untreated liquid from entering the dispensing system.

B 20 28. <sup>39</sup> The improvement of claim 1 <sup>arranged so that</sup> ~~wherein~~ the reservoir is illuminated to make rising bubbles visible.

29. <sup>38</sup> The improvement of claim 1 including a liquid circulating system communicating with the reservoir for circulating liquid during purification.

B 25 30. <sup>31</sup> The improvement of claim ~~29~~ <sup>30</sup> ~~wherein~~ <sup>arranged so that</sup> the liquid circulating system flows the ozone-containing gas into the reservoir.

B 31. <sup>32</sup> The improvement of claim ~~29~~ <sup>30</sup> ~~wherein~~ <sup>arranged so that</sup> the liquid circulating system flows purified liquid from the reservoir to a dispensing outlet upon completion of a purification cycle.

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<sup>33</sup>32. The improvement of claim <sup>30</sup>29 wherein the liquid circulating system includes a filter.

<sup>17</sup>33. The improvement of claim <sup>8</sup>32 wherein the dispensing system is arranged for circulating liquid to and from the reservoir during purification.

<sup>18</sup>34. The improvement of claim <sup>17</sup>33 arranged so that wherein circulated liquid flows the ozone-containing gas into the reservoir.

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<sup>10</sup>35. A system of venting a batch liquid reservoir during purification of the liquid by an ozone-containing gas pumped from an ozone generator into the reservoir, the system including:  
a vent pumping system arranged to draw gas from a vent space above the liquid in the reservoir to maintain the vent space at a pressure less than atmospheric.

<sup>35</sup>36. The system of claim <sup>34</sup>35 including a light illuminating bubbles rising in the reservoir.

<sup>36</sup>37. The system of claim <sup>34</sup>35 arranged so that wherein gas outflow from the vent pumping system is directed through an ozone-reducing element and then to atmosphere.

<sup>37</sup>38. The system of claim <sup>34</sup>35 including an air inlet into the vent space.

<sup>40</sup>39. The system of claim <sup>34</sup>35 arranged so that wherein the system includes dispensing purified liquid from the reservoir by moving a spout that can be extended beyond the housing of the purifier.

<sup>41</sup>40. The system of claim <sup>40</sup>39 including a switch blocking dispensing unless the spout is extended.

<sup>42</sup>41. The system of claim <sup>34</sup>35 including an indicator responsive to a measure of purifier operation to indicate a need for changing a filter for the dispensed purified liquid.

<sup>43</sup>42. The system of claim <sup>34</sup>35 arranged so that wherein inflow of air to a desiccant in an air inlet to the ozone generator is blocked except when liquid is being purified.

B 1337 arranged so that  
43. <sup>38</sup>The system of claim ~~38~~ wherein air flowing into the vent space cools a lamp illuminating bubbles rising in the reservoir.

44. The system of claim ~~35~~<sup>34</sup> including a barrier preventing liquid from leaving the vent space with out-flowing gas.

5 <sup>39</sup>45. The system of claim ~~38~~<sup>37</sup> including a barrier to prevent reservoir liquid from entering the air inlet.

<sup>45</sup>46. The system of claim ~~35~~<sup>34</sup> including a reservoir lid closing the vent space over the liquid.

<sup>46</sup>47. The system of claim ~~46~~<sup>45</sup> including a lid lock device  
10 operable during a purification cycle.

B <sup>47</sup>48. The system of claim ~~46~~<sup>45</sup> arranged so that wherein opening the lid resets the purifier to assume liquid in the reservoir is impure.

B <sup>48</sup>49. The system of claim ~~46~~<sup>45</sup> arranged so that wherein the vent pumping system operates after completion of pumping ozone gas into the reservoir.

15 <sup>49</sup>50. The system of claim ~~49~~<sup>48</sup> including an indicator indicating that it is safe to open the lid.

<sup>50</sup>51. The system of claim ~~35~~<sup>34</sup> including an indicator indicating completion of the pumping of ozone-containing gas into the reservoir.

20 <sup>51</sup>52. The system of claim ~~35~~<sup>34</sup> including a barrier arranged in a liquid outlet from the reservoir to prevent liquid from entering a dispensing system for purified liquid before the dispensing system is actuated.

<sup>52</sup>53. The system of claim ~~35~~<sup>34</sup> including liquid circulation from  
25 and to the reservoir during purification.

<sup>53</sup>54. The system of claim ~~53~~<sup>52</sup> including a filter for liquid circulating from and to the reservoir.

B <sup>54</sup>55. The system of claim ~~53~~<sup>52</sup> arranged so that wherein circulating liquid flows ozone-containing gas into the reservoir.

14 <sup>52</sup> arranged so that  
56. The system of claim <sup>53</sup> wherein purified liquid is  
dispensed via a path for liquid circulation.

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5 57. A method of purifying a batch of liquid in a reservoir by  
means of an ozone-containing gas pumped from an ozone generator  
into contact with the liquid in the reservoir, the method including:

- a. withdrawing ozone-containing gas from a vent space  
above the liquid in the reservoir;
- b. closing the vent space with a reservoir lid that can be  
opened to provide access to the reservoir; and
- 10 c. preventing liquid from entering a purified liquid  
dispensing system until the purified liquid dispensing  
system is operated.

58. The method of claim <sup>57</sup> including illuminating bubbles  
rising in the reservoir while the liquid is being purified.

15 59. The method of claim <sup>57</sup> wherein the purified liquid  
dispensing system includes a movable dispensing spout and a switch  
blocking dispensing system operation unless the spout is moved to  
extend from a housing of the purifier.

20 60. The method of claim <sup>57</sup> including blocking any outflow of  
liquid with the gas flowing out from the vent space.

61. The method of claim <sup>57</sup> including dispensing purified  
liquid from the reservoir by moving a spout to extend from a housing  
of the purifier.

25 62. The method of claim <sup>61</sup> including closing the dispensing  
outlet except when liquid is being dispensed.

63. The method of claim <sup>57</sup> including using a measure of  
purifier operation to indicate a need for changing a filter for the  
dispensed liquid.

30 64. The method of claim 57 including admitting air to the  
vent space.

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~~66.~~<sup>66</sup> The method of claim ~~57~~<sup>51</sup> including maintaining a subatmospheric pressure in the vent space while gas is being withdrawn from the vent space.

68. The method of claim 67 including indicating to an operator that it is safe to open the reservoir.

~~70.~~ The method of claim ~~57~~<sup>58</sup> including circulating liquid from and to the reservoir during purification.

~~72.~~<sup>70</sup> The method of claim ~~70~~<sup>69</sup> including using circulating liquid to flow the ozone-containing gas into the reservoir.

73. The method of claim ~~70~~<sup>62</sup> including dispensing purified liquid via a path for the circulating liquid.